

REMARKS

The Office Action mailed December 19, 2002, has been received and reviewed. Claims 1 through 37 are currently pending in the application. Applicants affirm the election without traverse to prosecute the invention of Group I, claims 1 through 13. Claims 14 through 37 have been withdrawn from consideration as being drawn to non-elected inventions. Claims 1 through 13 stand rejected.

Per this response, Applicants have cancelled claims 6 and 14 through 37; amended claims 1, 2, 4, 5 and 7 through 13, and respectfully request reconsideration of the application as amended herein.

Preliminary Amendment

Applicants' undersigned attorney notes the filing herein of a Preliminary Amendment on February 13, 2002, which filing was not acknowledged in the outstanding Office Action. Should the Preliminary Amendment have failed for some reason to have been entered in the Office file, Applicants' undersigned attorney will be happy to have a true copy thereof hand-delivered to the Examiner. The amendments set forth herein presume entry of the Preliminary Amendment.

Drawings

The drawings are objected to under 37 CFR 1.83(a) because they "fail to show heating device 238 (Section [0034]) as described in the specification." Applicants respectfully submit that, since the heating device 238 is clearly shown in FIGS. 2 and 3, the drawings satisfy the requirements of 37 CFR 1.83(a).

Furthermore, Applicants note that paragraph [0034] is primarily directed to disclosing the feedthrough device (208) as depicted in FIGS. 4A and 4B. While the heating device (238) is mentioned in paragraph [0034] in association with the feedthrough device (208), the heating device is not shown in FIGS. 4A and 4B for the purpose of clearly showing and describing various features of the feed through device. Applicants have amended paragraph [0034] to parenthetically indicate the disclosure of the heating device (238) in associated FIGS. 2 and 3 and

to more clearly place emphasis on the structure of the feedthrough device shown and described with respect to FIGS. 4A and 4B.

Applicants, therefore, respectfully request reconsideration and approval of the drawings.

35 U.S.C. § 112 Claim Rejections

Claims 4 and 6 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Applicants have cancelled claim 6 herein.

With respect to claim 4, Applicants have amended the claim 4 herein to state that “at least a portion of the second heated section is disposed within the continual helical groove of the feedthrough device.” Applicants submit that claim 4, as amended herein, satisfies the requirements of 35 U.S.C. § 112, second paragraph, and respectfully requests reconsideration thereof.

35 U.S.C. § 102(b) Anticipation Rejections

Anticipation Rejection Based on U.S. Patent No. 6,056,823 to Sajoto et al.

Claims 1 through 5 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Sajoto et al. (U.S. Patent No. 6,056,823). Applicants respectfully traverse this rejection, as hereinafter set forth.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Independent claim 1, as amended herein, is directed to a deposition chamber comprising: a chamber body having a cavity formed therein; a chamber lid configured to enclose the cavity; a vapor delivery head positioned within the cavity; a feedthrough device positioned in the chamber body, the feedthrough device having a longitudinal body portion and being configured to receive

vapor from a vapor source and transfer the vapor therethrough along a pathway toward the vapor delivery head; a heating device including a pair of resistor elements having at least a portion thereof disposed within a thermally conductive sheathing, the heating device including *a first nonheated section and a second heated section*, wherein at least a portion of the second heated section is configured to conduct heat to the longitudinal body portion of the feedthrough device; a layer of thermal insulation disposed between the at least a portion of the second heated section of the heating device and the chamber body and substantially circumscribing the longitudinal body portion and the at least a portion of the second heated section; and *a temperature sensing device disposed between the layer of insulation and the longitudinal body portion of the feedthrough device*.

The Examiner cites Sajoto as teaching a chamber body having a cavity formed therein; a chamber lid configured to enclose the cavity; a vapor head positioned within the cavity; a feedthrough device positioned in the chamber body and configured to receive vapor from a vapor source and transfer the vapor therethrough along a pathway toward the vapor delivery head; and a resistance heating device associated with the feedthrough device.

However, Applicants submit that Sajoto fails to teach all of the limitations of the presently claimed invention as set forth in claim 1. More specifically, claim 1 recites a heating device which includes *a heating device including a first nonheated section and a second heated section*. Additionally, claim 1 of the presently claimed invention includes a temperature sensing device *disposed between a layer of thermal insulation and a longitudinal body portion of the feedthrough device*, wherein the layer of thermal insulation is disposed between the at least a portion of the second heated section of the heating device and the chamber body and substantially circumscribes the longitudinal body portion and the at least a portion of the second heated section.

Applicants note that, while Sajoto teaches a “cable type heater 64” (col. 6, line 31) used in conjunction with a feedthrough device, it fails to teach that such a heater includes a first nonheated section and a second heated section. Nor does Sajoto teach that a temperature sensing device be disposed between a layer of thermal insulation and the feedthrough device wherein the

layer of insulation is further disposed between the at least a portion of the second heated section of the heating device and the chamber body and substantially circumscribes the longitudinal body portion and the at least a portion of the second heated section.

Rather, Sajoto teaches that a “radiation shield 65 is disposed over the heater to prevent thermal radiation for heating the outer shell 41” (col. 6, lines 34-36), while, as shown in FIGS. 2 and 3A, a thermocouple (66) is disposed *external* to the radiation shield 65. In other words, Sajoto’s thermal radiation shield is disposed between the thermocouple and the heating device.

Applicants, therefore submit that claim 1 of the presently claimed invention is not anticipated by Sajoto. Applicants further submit that claims 2 through 5 are also allowable over Sajoto at least by virtue of their dependency from an allowable base claim.

Applicants respectfully request reconsideration and allowance of claims 1 through 5.

35 U.S.C. § 103(a) Obviousness Rejections

Obviousness Rejection Based on U.S. Patent No. 6,056,823 to Sajoto et al. in View of U.S. Patent No. 4,638,150 to Whitney

Claims 6 through 13 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Sajoto et al. (U.S. Patent No. 6,056,823) in view of Whitney (U.S. Patent No. 4,638,150).

Applicants respectfully traverse this rejection, as hereinafter set forth.

M.P.E.P. 706.02(j) sets forth the standard for a Section 103(a) rejection:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, **the prior art reference (or references when combined) must teach or suggest all the claim limitations.** The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant’s disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). (Emphasis added).

The 35 U.S.C. § 103(a) obviousness rejections are improper because the references relied upon fail to teach or suggest all of the limitations of the presently claimed invention.

As previously noted, claim 6 has been cancelled herein.

Claims 7 through 13 each depend, either directly or through an intervening claim, from independent claim 1. Claim 1, as amended herein, is directed to a deposition chamber comprising: a chamber body having a cavity formed therein; a chamber lid configured to enclose the cavity; a vapor delivery head positioned within the cavity; a feedthrough device positioned in the chamber body, the feedthrough device having a longitudinal body portion and being configured to receive vapor from a vapor source and transfer the vapor therethrough along a pathway toward the vapor delivery head; a heating device including a pair of resistor elements having at least a portion thereof disposed within a thermally conductive sheathing, the heating device including *a first, nonheated section and a second, heated section*, wherein at least a portion of the second heated section is configured to conduct heat to the longitudinal body portion of the feedthrough device; a layer of thermal insulation disposed between the at least a portion of the second heated section of the heating device and the chamber body and substantially circumscribing the longitudinal body portion and the at least a portion of the second heated section; and *a temperature sensing device disposed between the layer of insulation and the longitudinal body portion of the feedthrough device*.

As set forth above, Applicants submit that Sajoto fails to teach or suggest all of the limitations of the presently claimed invention as set forth in claim 1. More specifically, Sajoto fails to teach or suggest *a heating device including a first, nonheated section and a second, heated section*. Nor does Sajoto teach or suggest *a temperature sensing device disposed between a layer of thermal insulation and a longitudinal body portion of the feedthrough device*, wherein the layer of thermal insulation is disposed between the at least a portion of the second, heated section of the heating device and the chamber body and also substantially circumscribes the longitudinal body portion and the at least a portion of the second heated section. Applicants further submit that Whitney fails to teach such subject matter.

Additionally, Applicants submit that Sajoto expressly teaches away from the presently claimed invention as set forth in claim 1. As noted above, Sajoto teaches that a thermal radiation shield is disposed over the heater to prevent thermal radiation for heating an associated outer shell while the thermocouple is disposed *external* to the thermal radiation shield relative to the heating device. (See, e.g., col. 6, lines 34-36; FIGS. 2 and 3A).

Applicants, therefore, respectfully submit that claims 7 through 13 are allowable over Sajoto and Whitney, either considered separately or in combination, and respectfully requests reconsideration thereof.

With respect to claims 8-10, the Examiner cites Whitney for teaching a flexible wire heater device which includes electrical resistance leads having at least a portion there disposed within a stainless steel conductive sheathing and “a thermocouple (‘PTC component 14’, ‘temperature-responsive component 14’; column 4, lines 54-68) positioned within the conductive sheathing to form a ‘self-limiting’ heater.” (Office Action, page 7). Applicants respectfully disagree with the Examiner’s position that the “PTC component 14” (also styled as “temperature-responsive component 14”) may be characterized as a thermocouple (or temperature sensing device) as set forth in the presently considered Office Action.

Applicants note that a basic thermocouple conventionally includes a pair of dissimilar metal components forming a junction therebetween to produce a temperature induced voltage, which voltage may be correlated to the local temperature experienced by the device. Other temperature sensing devices, while operating on slightly different principles, similarly produce a temperature induced signal for determination and monitoring of the temperature by, for example an operator or a control system. Whitney fails to disclose such a temperature sensing device. Rather, Whitney discloses a modular heater including a pair of elongate conductors and a plurality of rigid heating modules connected in parallel with each other between the conductors. The heating modules include “a temperature-responsive component 14 that has a positive temperature coefficient of resistance.” (Col. 4, lines 54-56). As further explained by Whitney, the temperature-responsive component “is thermally coupled to the heating component and ... has an electrical property which varies so that, when the heater is connected to the power supply,

the heat generated by the module decreases substantially as the temperature of the module approaches an elevated temperature.” (Col. 2, lines 10-18). Furthermore, Whitney states that, for purposes of the Whitney disclosure, “a material is defined as having a ‘positive temperature coefficient of resistance’ if it increases in resistivity, in the temperature range of operation, sufficiently to render the heater self regulating.” (Col. 2, lines 25-29).

In other words, the heater taught by Whitney is self regulating because it incorporates, as part of its heating module, a material which exhibits a substantial change in resistance over a selected operating temperature range. Thus, as the resistance of the material changes, the heat produced by the heating module correspondingly changes. Such a device is markedly different from a temperature sensing device such as, for example, a thermocouple.

Applicants, therefore, submit that Whitney fails to teach or suggest a temperature sensing device (including a thermocouple) and furthermore fails to teach or suggest such a device which is disposed within a conductive sheathing.

With respect to claim 11, the Examiner views the limitation of at least a portion of the thermally conductive sheathing being “cold formed” into a helical pattern to be a product-by-process limitation. The examiner then states that Whitney shows a similar product (i.e., a thermally conductive sheathing) and, that under a product-by-process analysis, it doesn’t matter how the product was made, just that the product is disclosed.

Applicants respectfully disagree with the Examiner’s assessment that claim 11 is a product-by-process claim. Rather than setting forth a product-by-process limitation, claim 11 indicates that a portion of the thermally conductive sheathing is configured in a helical pattern, complementary to the continual helical groove, and that since it is “cold formed” it retains its shape as a complementary helical configuration. That the term “cold formed” defines a structural limitation is further evidenced by the specification which states: “the heating device 238 may include a sheath which is cold formable, as set forth above, meaning that the heating device 238 may be formed into the helical groove 260 and substantially hold its position therein without having to hot work the heating device 238 or otherwise secure it.” (As-filed specification, paragraph [0039]).

Applicants submit that neither Sajoto or Whitney teach or suggest such a limitation. As such, Applicants respectfully request reconsideration of claim 11.

With respect to claim 13, the Examiner states that it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace Sajoto's heater with Whitney's heater by welding Whitney's heater to Sajoto's feedthrough device. However, Applicants submit that welding of Whitney's device, with the associated localized application of intense heat, would pose a substantial risk of damaging the electrical circuits formed on the heaters (8) and thereby render the device of Whitney ineffective. Thus, one of ordinary skill in the art would not be motivated to weld the device of Whitney to the feedthrough device of Sajoto.

Applicants, therefore, respectfully request reconsideration and allowance of claims 7 through 13.

ENTRY OF AMENDMENTS

The amendments to claims 1, 2, 4, 5 and 7 through 13 above should be entered by the Examiner because the amendments are supported by the as-filed specification and drawings and do not add any new matter to the application.

CONCLUSION

Claims 1 through 5 and 7 through 13 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, he is respectfully invited to contact Applicants' undersigned attorney.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Bradley B. Jensen", followed by a horizontal line.

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Enclosure: Version With Markings to Show Changes Made

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

Please amend paragraph [0034] as set forth below.

[0034] Referring to FIGS. 4A and 4B, a feedthrough device 208, configured for cooperative use with the heating device 238, (FIGS. 2 and 3) is shown. The feedthrough device 208 includes a bore or lumen 252 extending longitudinally therethrough and which forms a part of the vapor delivery path 207. The feedthrough device 208 further includes a shoulder portion 254 at its upper end. The shoulder portion 254 serves to locate and position the feedthrough device 208 within the chamber body 202. Additionally, as seen the FIG. 4B, one or more channels or grooves 256 may be formed in the top and bottom surfaces 254A and 254B of the shoulder portion 254 to accommodate o-rings or other types of seals 230, 232 (see FIG. 2).

IN THE CLAIMS:

1. (Twice Amended) A deposition chamber comprising:
a chamber body having a cavity formed therein;
a chamber lid configured to enclose the cavity;
a vapor delivery head positioned within the cavity;
a feedthrough device positioned in the chamber body, the feedthrough device having a longitudinal body portion and being configured to receive vapor from a vapor source and transfer the vapor therethrough along a pathway toward the vapor delivery head; [and]
a heating device [associated with the feedthrough device] including a pair of resistor elements having at least a portion thereof disposed within a thermally conductive sheathing, the heating device including a first, nonheated section and a second, heated section, wherein at least a portion of the second heated section is configured to conduct heat to the longitudinal body portion of the feedthrough device;
a layer of thermal insulation disposed between the at least a portion of the second, heated section of the heating device and the chamber body and substantially circumscribing the longitudinal body portion and the at least a portion of the second, heated section; and
a temperature sensing device disposed between the layer of insulation and the longitudinal body portion of the feedthrough device.

3. (Amended) The deposition chamber of claim 2, wherein the feedthrough device includes [a longitudinal body portion having] a continual helical groove formed on a surface [thereof] of the longitudinal body portion.

4. (Twice Amended) The deposition chamber of claim 3, [wherein the heating device includes a resistance heater and] wherein at the least a portion of the [resistance heater] second, heated section is [position of] disposed within the continual helical groove of the feedthrough device.

5. (Twice Amended) The deposition chamber of claim 4, wherein the continual helical groove is configured to complementarily receive the at least a portion of the [resistance heater] second heated section.

7. (Amended) The deposition chamber of claim [6] 1, wherein the thermally conductive sheathing is formed of stainless steel.

8. (Amended) The deposition chamber of claim [6] 1, wherein the [heating device further includes a] temperature sensing device is disposed within the thermally conductive sheath.

9. (Twice Amended) The deposition chamber of claim [8] 1, wherein the temperature sensing device includes a thermocouple.

10. (Amended) The deposition chamber of claim 9, wherein the thermocouple is positioned within the thermally conductive sheathing.

11. (Twice Amended) The deposition chamber of claim [6] 1, wherein at least a portion of the thermally conductive sheathing is cold formed into a helical pattern complementary with the continual helical groove.

12. (Amended) The deposition chamber of claim [6] 1, wherein at least a portion of the thermally conductive sheathing is adhered to the feedthrough device.

13. (Amended) The deposition chamber of claim [6] 1, wherein at least a portion of the thermally conductive sheathing is welded to the feedthrough device.